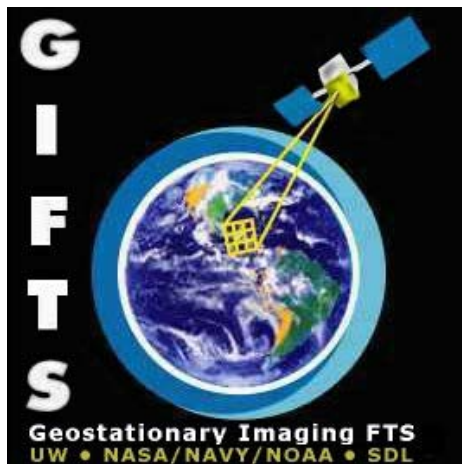


Title: Configuration Management Plan	
Document No.: GIFTS 01-011	Version: 2.0



Geosynchronous Imaging Fourier Transform Spectrometer

Configuration Management Plan

August 11, 2003

Title: Configuration Management Plan	
Document No.: GIFTS 01-011	Version: 2.0

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REVISION HISTORY

Version	Date	Description
1.0	03/01	First Release
2.0	08/11/03	Revise CM control section, CR Form and text changes from a Mission to an Instrument Project.

Title: Configuration Management Plan	
Document No.: GIFTS 01-011	Version: 2.0

Table of Contents

1	INTRODUCTION	1
<i>1.1</i>	<i>PURPOSE</i>	<i>1</i>
<i>1.2</i>	<i>SCOPE</i>	<i>1</i>
<i>1.3</i>	<i>REFERENCED DOCUMENTS</i>	<i>2</i>
<i>1.4</i>	<i>DEFINITIONS</i>	<i>2</i>
2	ORGANIZATION	3
<i>2.1</i>	<i>ORGANIZATIONAL STRUCTURE</i>	<i>3</i>
<i>2.2</i>	<i>RESPONSIBILITIES.....</i>	<i>4</i>
<i>2.3</i>	<i>RELATIONSHIP BETWEEN THE PROJECT OFFICE AND SUPPORTING ORGANIZATIONS</i>	<i>5</i>
3	CONFIGURATION IDENTIFICATION	5
<i>3.1</i>	<i>BASELINE IDENTIFICATIONS.....</i>	<i>5</i>
3.1.1	Allocated Baseline	6
3.1.2	Fabricated Baseline.....	6
3.1.3	Integrated Baseline	7
3.1.4	Ground Support Equipment Baseline.....	7
3.1.5	Software Baseline	7
<i>3.2</i>	<i>CONFIGURATION ITEMS</i>	<i>7</i>
3.2.1	Documents	7
3.2.2	Presentations	8
3.2.3	Document List	8
3.2.4	Drawings	8
3.2.5	Hardware	8
3.2.6	Software	8
3.2.7	Firmware	9
4	CONFIGURATION CHANGE CONTROL.....	9
<i>4.1</i>	<i>CONFIGURATION CONTROL BOARDS.....</i>	<i>9</i>
4.1.1	Project CCB Responsibilities	10
4.1.2	WBS Leads CCB Responsibilities	10
4.1.3	Contractors CCB Responsibilities.....	11
<i>4.2</i>	<i>CONFIGURATION CHANGE CONTROL PROCESS</i>	<i>11</i>
4.2.1	Change Request Form	11
4.2.2	Requesting Changes.....	11
<i>4.3</i>	<i>PROBLEM REPORTING AND CORRECTIVE ACTION SYSTEM</i>	<i>15</i>
<i>4.4</i>	<i>WAIVERS AND DEVIATIONS.....</i>	<i>15</i>
5	CONFIGURATION STATUS ACCOUNTING	15

Title: Configuration Management Plan	
Document No.: GIFTS 01-011	Version: 2.0

5.1	<i>CONFIGURATION SYSTEM REPORTS</i>	<i>15</i>
5.2	<i>CONFIGURATION STATUS ACCOUNTING REPORT.....</i>	<i>16</i>
6	CONFIGURATION VERIFICATION (AUDITS).....	16
6.1	<i>FUNCTIONAL CONFIGURATION AUDITS</i>	<i>16</i>
6.2	<i>PHYSICAL CONFIGURATION AUDITS.....</i>	<i>16</i>
6.3	<i>CONFIGURATION VERIFICATION</i>	<i>17</i>
7	RECORDS COLLECTION AND RETENTION	17
8	CONTRACTOR/VENDOR CONTROL.....	17
9	ACRONYMS.....	17

Title: Configuration Management Plan	
Document No.: GIFTS 01-011	Version: 2.0

1 INTRODUCTION

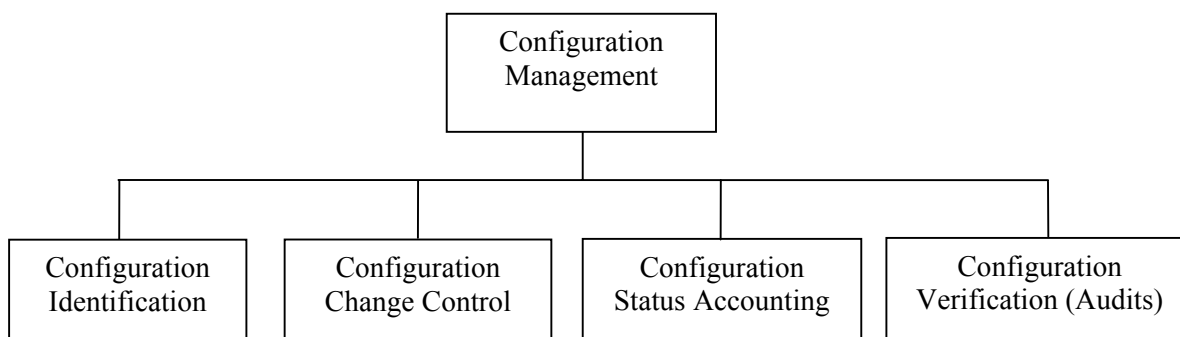
1.1 Purpose

This Configuration Management Plan (CMP) establishes the overall plan to be used by the National Aeronautics and Space Administration (NASA) Langley Research Center (LaRC) for Configuration Management during all life cycle phases of the Geosynchronous Imaging Fourier Transform Spectrometer (GIFTS) project. This CMP complies with the technical standards set by ANSI/EIA-649-199 “National Consensus Standard for Configuration Management,” IEEE Std 828-1998 “IEEE Standard for Software Configuration Management Plans,” and ISO 10007 “Guidelines for Configuration Management.” It is written at a instrument-level to establish policies, standards, procedures, and uniform practices for configuration management of all hardware, computer software, firmware, and associated documentation and drawings to be used for the GIFTS Instrument, Space/Mission Operations, and Ground Systems elements of the Instrument.

1.2 Scope

Configuration Management is a formal and disciplined system for identifying, controlling, verifying and accounting the physical and functional characteristics (i.e., form, fit, and function) of an item to ensure that the final product is built and qualified to specification. Configuration management is not an isolated endeavor; it exists to support product development and maintenance. As shown in Figure 1.2-1, Configuration management consists of four major divisions:

Figure 1.2-1 The Major Divisions of Configuration Management



This plan applies to all project documentation, hardware, drawings, computer programs, tools, and processes used in the production of all systems for the GIFTS Project and includes all phases of the project development life cycle.

The CMP is a living document and as a result, additions, deletions, and modifications may occur as it is utilized. It will be updated as additional configuration activities are defined as the work proceeds and the necessity arises. Therefore, to provide configuration identification, this

Title: Configuration Management Plan	
Document No.: GIFTS 01-011	Version: 2.0

standard will be identified with an issue or version number and be released via configuration control to the relevant authorities as specified in this plan.

1.3 Referenced Documents

The following specifications, standards, manuals and handbooks form a part of this document to the extent specified herein.

NPG 7120.5B – NASA Program and Project Management Processes and Requirements

ISO 9001 – Quality Systems Model for Quality Assurance Design, Development, Production, Installation, and Servicing

ISO 10007 – Guidelines for Configuration Management

IEEE Std 828-1998 – Software Configuration Management Plans

IEEE Std 1042-1987 – Guide to Software Configuration Management

LMS-CP-5502 – Aerospace Customer Requirements Definition and Implementation Planning within System Engineering

LMS-CP-5510 – Aerospace Systems Change Control within System Engineering

LMS-CP-5528 – Software Planning, Development, Maintenance, Acquisition, Maintenance, and Operations

1.4 Definitions

The following definitions apply this document to the extent specified herein.

- Configuration – Configuration is the functional and physical characteristics of parts, assemblies, equipment or systems, or any combination of these which are capable of fulfilling the fit, form, and functional requirements defined by applicable performance specifications and engineering drawings.
- Configuration Baseline – A document, drawing, software, hardware, or firmware product that has been reviewed, agreed upon by appropriate project personnel, and that thereafter serves as the basis for further development and can be changed only through change control procedures.
- Configuration Control – Configuration control involves the systematic evaluation, coordination, and formal approval/disapproval of proposed changes to a configuration. It includes the implementation of all approved changes to the design and production of a Configuration Item (CI) whose configuration has been formally approved.
- Configuration Identification – Configuration identification includes the selection of CIs, the determination of the types of configuration documentation required for each CI, the issuance of numbers and other identifiers affixed to the CIs and to the technical documentation that defines the CIs configuration. This includes internal and external interfaces and the establishment of configuration baselines for the CIs.

Title: Configuration Management Plan	
Document No.: GIFTS 01-011	Version: 2.0

- Configuration Item – An aggregation of hardware, software and/or related documentation that satisfies an end use function or a product that is designated by the Project Manager for configuration management.
- Configuration Status Accounting – An on-going process of recording and reporting all information required to manage the configuration items effectively.
- Configuration Verification – The purpose of verification is to prove that the actual configurations of the hardware or software CIs conform to the intended configuration (the as-built matches the as-designed plus changes).
- Deviation – A specific written authorization, granted prior to the manufacture of an item. It is a request to depart from a particular requirement of an item’s current approved configuration documentation for a specific number of units or a specified period of time.
- Drawings – Engineering documents that disclose by pictorial or textual presentation, or both, the physical and functional requirements of an item.
- Life Cycle – The period of time that starts when a product is conceived and ends when the product is no longer available for use.
- Waiver – A written authorization to accept an item, which during manufacture, or after having been submitted for acceptance, is found to depart from specified requirements. It nevertheless is considered suitable for use “as is” or suitable after repair by an approved method.

2 ORGANIZATION

2.1 Organizational Structure

The GIFTS Project Manager has total responsibility for configuration management of the GIFTS Instrument. This CMP has been produced to provide overall policy and planning guidance for configuration management throughout this project. The major elements that report to the Project Manager are:

- WBS 2 Measurement Concept & Technology Validation
- WBS 3 System Engineering
- WBS 4 Instrument
- WBS 6 Mission Operations
- WBS 7 Ground Systems

Each element is managed by a Work Breakdown Structure (WBS) Lead to allow a single point-of-contact for each team. These leads are responsible for insuring that configuration management procedures are followed within the teams.

Title: Configuration Management Plan	
Document No.: GIFTS 01-011	Version: 2.0

The GIFTS Project Manager is responsible for implementing a configuration management process that provides for establishment of CIs and the controlled evaluation and disposition of changes, deviations and waivers to those CIs. The configuration management process shall ensure that changes having interfaces with other organizations that participate in the GIFTS project have been coordinated and concurrence obtained, before implementation of the changes are authorized.

2.2 Responsibilities

The GIFTS Project Manager:

- Is responsible for adherence to this Plan,
- Appoints a Configuration Manager (CM),
- Determines the degree of control from one baseline to the next,
- Appoints, in writing, the individual members assigned to the Configuration Control Board (CCB),
- Assigns specific project members for action and reporting the status of the CCB actions,
- Serves as the Chairperson of the Project-Level CCB,
- Has signature authority for Project-Level configuration changes, and
- Establishes, in writing, the point at which the various configurations become subject to formal configuration control

The GIFTS CM:

- Implements and manages a configuration management process, to include:
 - Configuration Identification
 - Configuration Control
 - Configuration Status Accounting
 - Configuration Auditing
- Assures that change control documents are processed in accordance with established change procedures
- Serves as the single point of contact for all matters pertaining to configuration management requirements for the GIFTS Project
- Responsible for the GIFTS CCB secretary
- Provides for system-wide configuration control
 - Maintains the configuration of system documentation, hardware, and software for all project phases, including operations

Title: Configuration Management Plan	
Document No.: GIFTS 01-011	Version: 2.0

- Maintains status accounting records; issues and distributes configuration accounting reports.

Configuration management is an element of the GIFTS Assurance Management function.

The GIFTS Project personnel are responsible for:

- Implementation of the policy and procedures detailed in this document,
- The maintenance of documentation regarding each system and for resolution of assigned Change Requests (CRs), and
- Requesting changes using a CR for all baselined items.

2.3 Relationship Between the Project Office and Supporting Organizations

The GIFTS Project Office is managing the Instrument development .

Work performed at LaRC or via contracts under the WBS Leads are required to utilize appropriate levels of configuration management in support of the GIFTS Project Office. Contractor and subcontractor configuration management requirements are set by the customer contract and will implement configuration management according to individual company/organization process and contractual requirements and agreements. Management of each these organizations will act as, or designate, a CM, with full authority to evaluate configuration CRs, implement necessary documentation procedures, and evaluate the impact of CRs. These organizations have the authority to disposition changes for which it has responsibility. Change affecting higher-level requirements will be submitted with recommendations to the WBS Lead for disposition. It is incumbent upon each organization to fully understand the impact of possible changes and to refer any requests that may have ramifications to ICDs or the Project up to the appropriate level of CCB.

All LaRC contracted and LaRC developed deliverables will be controlled in accordance with this plan.

3 CONFIGURATION IDENTIFICATION

Configuration identification, in general, provides the means by which the performance, qualification, fabrication, and acceptance requirements associated with the product under development are progressively defined, documented, and placed under control. Documents (plans, specifications, procedures, processes, and other technical documentation) and drawings that identify and describe Configuration Identification and Computer Software Configuration Items (CSCIs) are to be assigned numbers at the time of completion.

3.1 Baseline Identifications

Using appropriate technical documents (including specifications, drawings, computer software listings, and part lists), the configuration identification process establishes baselines with more detailed descriptions of the functional and physical characteristics of the items. The baselines are established by the GIFTS CCB at points in the program where it is deemed necessary to

Title: Configuration Management Plan	
Document No.: GIFTS 01-011	Version: 2.0

provide a definable and manageable departure point for the development and production of the system or item. The baseline, plus any approved changes to it, constitutes the current binding configuration identification (that is, the technical definition of what the system/item is expected to accomplish). By establishing baselines, the orderly development of the system from specifications into design documentation, and then into the hardware and software items, is possible. Once the configuration items are baselined, any changes to the configuration must be approved by the GIFTS CCB.

For the GIFTS Project, baselines for the different systems are established when the system has completed a Critical Design Review (CDR). The CDRs will insure:

- Acceptance of basic design approach
- Compliance with project requirements
- Definition of Interface Requirements
- Produceability
- Test Planning
- Safety Assessments
- Release of detailed design
- Qualification Test Requirements

Upon completion of the CDR process, the system design will have been finalized, and any further changes must be approved by the GIFTS CCB. It is the responsibility of the WBS Lead to submit a list of configuration items, for the system design, to the CM for inclusion into the configuration control process. It is also the responsibility of the WBS Lead to insure that no changes are allowed in the system design once the design has been baselined unless the change control process is utilized.

3.1.1 Allocated Baseline

The allocated baseline will be the approved documentation describing an item's functional, interoperability, and interface characteristics that are allocated from those of a system or a higher level configuration item, interface requirements with interfacing configuration items, additional design constraints, and the verification required to demonstrate the achievement of those specified characteristics.

3.1.2 Fabricated Baseline

The fabricated drawings with all red-line changes incorporated will constitute the fabricated baseline. Changes made to fabricated hardware shall be documented, initialed and dated by the cognizant engineer and the assigned technician or Quality Assurance (QA) Specialist. The cognizant engineer shall be responsible for assuring that drawings are revised to include the red-line changes.

Title: Configuration Management Plan	
Document No.: GIFTS 01-011	Version: 2.0

3.1.3 Integrated Baseline

The revised integrated drawings with all red-line changes incorporated constitute the integrated baseline. Changes made to the integrated instrument, software, and associated documentation shall be documented on a GIFTS CR form and require GIFTS CCB approval and QA verification. The CM will establish a master file of revised integrated drawings with approved CRs attached which will establish the delivered instrument configuration.

3.1.4 Ground Support Equipment Baseline

The Ground Support Equipment (GSE) system will be built, tested, and used in support of the instrument and/or platform. Prior to use with the instrument, the GSE hardware configuration will be verified, and any changes will be signed off by the appropriate engineering personnel. This will constitute the GSE baseline configuration, and any subsequent changes shall be documented on the GIFTS CR and require GIFTS CCB approval and QA verification.

3.1.5 Software Baseline

All software, including delivered software, will constitute the software baseline configuration, and any subsequent changes shall be documented on the GIFTS CR and require GIFTS CCB approval and QA verification.

3.2 Configuration Items

Since the GIFTS Project consists of different segments there will be a unique numbering system that provides some uniformity among the elements. Each CI shall have a complete name, an optional acronym, and a number. This identification of CIs will allow the project to control and have traceability between the different elements of the project. It will be the responsibility of the CM to insure a consistent numbering scheme for the CIs.

3.2.1 Documents

All documents approved by the GIFTS Project will be under configuration control and numbered using the following numbering scheme: GIFTS XX-XXX, the XX is the WBS area and the XXX represents a sequential numbering scheme for each document generated starting with the number 001

The CM will create a document template to be used for all GIFTS Project documentation. This template should include a cover page that identifies the common, frequently used attributes to facilitate tracking. The cover page header shall include the title of the document, document number (provided by the CM), and version number. This information will subsequently be displayed on each page. The cover page should also include the project name, document title, and date. Page two should be the signature page that includes all the names and titles of the signers. Page three should be the Revision History that includes the version, revision date, and a description of the change. Page four is the table of contents followed by the body of the document and any appendices. The actual marking of changes is vertical bars placed adjacent to the line(s) being revised on the right hand margin. All previous revisions are to be accessible.

The GIFTS CM maintains hard and electronic copies of each product as a historical record until the project is terminated. Documents, the numbers, and changes to documents will be issued and

Title: Configuration Management Plan	
Document No.: GIFTS 01-011	Version: 2.0

validated by the GIFTS CM. It will be the responsibility of the CM to insure a consistent document format for these CIs.

Appendix A shows how to baseline a document.

3.2.2 Presentations

All presentations will be numbered and dated using the following numbering scheme:

GIFTS (meeting name)-XXX, the XXX represents a sequential numbering scheme for each presentation generated starting with the number 0001. The GIFTS CM will maintain a hard and electronic copies of each product as a historical record until the project is terminated.

3.2.3 Document List

A GIFTS Document List will catalog memorandum of agreements, plans, project requirements, detailed derived requirements, the CIs, and interface control documents. The List will be maintained by the GIFTS CM. The List should contain at least the document name, number, author, CCB control level, version, and date of baseline. The top-level design of the hardware/software CIs is documented in hardware/software design documents, while the lower levels of the design are carried forth into engineering drawings/behavioral diagrams. Each level of decomposition (system, element, and CI) contains the test plans, test procedures, and test reports.

3.2.4 Drawings

All parts, assemblies, and installations required to make up a CI are to be completely defined by engineering drawings. A standard drawing numbering system, drawing control system, and documentation control system similar to the LAPG 7320.1, Engineering Drawing System should be instituted. All completed approved drawings, including a hard copy of electronically generated drawings, should be maintained and accessible. Each WBS lead will designate a responsible individual to keep track of drawings and numbers and to maintain currency. The designated individual will be responsible for coordinating changes and updates with the GIFTS CM.

Commercial off-the-shelf items may be exempted from this requirement as deemed appropriate by the project and/or specified in the appropriate contract or purchase order.

3.2.5 Hardware

All GIFTS hardware parts and assemblies are to be identified by an identification number consisting of a part number, serial number, and/or drawing number. Methods used to identify hardware such as engraving, ink markings, or tags will be compatible with hardware being labeled or as specified in appropriate product assurance / quality assurance plans.

3.2.6 Software

All software developed for the GIFTS Project shall follow standard programming guidelines established by the GIFTS Software Project Management Plan so that software is uniform. Computer Software Configuration Items (CSCIs) requiring identification are computer programs and files which include, but are not limited to, diagnostics and actual programs, support, data,

Title: Configuration Management Plan	
Document No.: GIFTS 01-011	Version: 2.0

control files, etc. All CSCIs will have a documented methodology for identifying, controlling and tracking the version number, file number, description, etc. of the software items under development. This includes the version of the software products, the build status of the software products, coordination of modifying a given product by more than one person, coordination of modifying multiple software products from more than one location, and tracking of change requests from initiation through release. Media labels must contain the Project title, content description, date electronic files were transferred to the media, disk or tape sequence number, and disposal date. It will be the responsibility of the GIFTS CM with help from the Software Manager to insure a consistent numbering scheme for these CIs and deliverables.

3.2.7 Firmware

Firmware items requiring identification and configuration control include Read Only Memory (ROM), Programmable (P) ROM, Erasable (E) PROM, Electrically (E) EPROM, Field Programmable Gate Arrays (FPGAs), and other applicable items.

4 CONFIGURATION CHANGE CONTROL

Configuration change control is the process of evaluating, and implementing required and approved changes to an established configuration baseline. The object of configuration change control is to ensure that changes are properly defined and the impact of those changes (i.e., evaluations of cost, schedule and performance) presented to management for appropriate decisions. Also, to assure proper implementation and documentation of the changes.

4.1 Configuration Control Boards

The CCB is a group of technical and administrative project personnel who are responsible for reviewing and assessing changes to baselines. The CCB makes recommendations to the CCB chairperson for approval or disapproval. The CCB will meet at the direction of the chairperson. The CCB Secretary will record and maintain minutes of all CCB meetings. The minutes, as a minimum, will include the:

- The meeting time, date and place
- List of all attendees including those by telecom
- Summary of disposition directed by CCB Chairperson on each item on the meeting agenda for that day.
- All actions with names of responsible individuals (may be a part of the disposition summary notes).

The plan is to:

- (a) Have regularly scheduled meetings at a fixed time and place.
- (b) An agenda will be published 1 week prior to the meeting, listing all change requests to be covered at the meeting. The goal is to enable the individuals involved to review the material in depth prior to the meeting, and thus to have an opportunity to raise concerns.

Title: Configuration Management Plan	
Document No.: GIFTS 01-011	Version: 2.0

- (c) The secretary ensures that the paperwork is distributed in a timely manner, including the agendas, minutes of the previous meeting, and the material to be considered as part of the next meeting

The GIFTS Project at Langley Research Center has two levels of CCBs. Each level has the authority to disposition changes for which it has responsibility. Changes affecting higher-level responsibility will be submitted with recommendations to the Project CCB for disposition. The two CCBs will work closely to maintain the information flow and configuration accounting necessary for effective decisions to be made. Any disagreement will be arbitrated at the Project-level CCB.

There are two Levels of CCBs as follows:

The Project CCB Level

The WBS CCB Level

There is only one Project CCB but there are 3 WBS CCBs as follows:

WBS 2.0 Measurement Concept & Technology Validation

WBS 4.0 Instrument

WBS 6.0 & 7.0 Mission Operations and Ground Systems

4.1.1 Project CCB Responsibilities

Chairperson: Project Manager

Members: Project Technologist
Deputy Project Manager, - Technical
CCB Secretary (CM)
WBS Leads
Systems Engineer
Other team members as required

Scope: Changes affecting cost, schedule, resources, government furnished equipment, technical content, weight, performance, power, safety, reliability, interfaces between mission elements, science/measure concept, technology validation, mission/system requirements, or deliverables.

4.1.2 WBS Leads CCB Responsibilities

Chairperson: WBS Lead

Members: CCB Secretary (CM)
Subsystem Leads
Systems Engineer
other team members as required

Title: Configuration Management Plan	
Document No.: GIFTS 01-011	Version: 2.0

Scope: Changes including but not limited to those affecting the internal interfaces, cost, schedule, and performance of the respective WBS. This level includes WBS specific issues, LaRC specific issues, and the WBS contractor's issues - changes that contractors may have elevated to this level.

4.1.3 Contractors CCB Responsibilities

Contractors shall assign responsibilities within the contractor's organization for the implementation of a formal configuration management system that satisfies the requirements detailed in the respective Statements Of Work (SOW) or product assurance plans. Contractor configuration management requirements shall be allocated to the associated subcontractors and shall be subject to approval by the respective prime contractor.

If a change is elevated to the WBS Lead, the change will be documented on a CR form and will follow the configuration control process described in this plan.

4.2 Configuration Change Control Process

Figure 4.3-1 illustrates the GIFTS Configuration Control Process

4.2.1 Change Request Form

The CR form should be used for requesting changes to any CI or CSCI associated with the project. The GIFTS Project will implement a standard CR form for use throughout the project. The CR form shown in Appendix B may be down-loaded from the GIFTS Electronic Data Management System (EDMS); otherwise contact the CCB Secretary or CM. The CCB Secretary is responsible for creating and maintaining the CR hardcopy and electronic filing system, recording receipt of the CR, and preparing the CR package for CCBs. The CCB Secretary role may be assumed by the CM or delegated to a separate person. The CM is responsible for the CCB Secretary when delegated to a separate person.

4.2.2 Requesting Changes

Any changes that will modify a baselined CI shall be documented by a CR form. Changes to any of the CIs may be initiated by members of the GIFTS Project, supporting organizations, or researchers involved with the GIFTS Project. The CR is submitted against baselined CIs. The CR may be a new requirement, an enhancement/modification, or a defect correction.

The priority of the CR will establish the initial method of processing the change. If the requester has not established a priority the CM, in conjunction with other technical engineers, shall recommend a priority to the CCB chairperson. Three priority levels shall be used:

1. Emergency – This priority shall be assigned when failure to immediately implement a change in operational characteristics may seriously compromise the effectiveness of the equipment or when a hazardous condition exists that may result in fatal or serious injury or extensive damage or destruction of the equipment. Emergency changes shall be dispositioned within 24 hours of receipt.

Title: Configuration Management Plan	
Document No.: GIFTS 01-011	Version: 2.0

2. Urgent – This priority shall be used to affect a change that, if delayed, would cause schedule slippage or cost increases. Urgent changes shall be dispositioned within 15 days of receipt.
3. Routine – This priority shall be used when the conditions specified in 1 and 2 above do not exist. Routine changes shall be dispositioned within 30 days of receipt

All changes are to be classified as follows:

- a. Class I - Changes which impact cost, schedule, performance, interface, or other project defined criteria.
- b. Class II - Changes which correct documentation errors, add clarifying notes, etc.

GIFTS Change Request (CR) Process

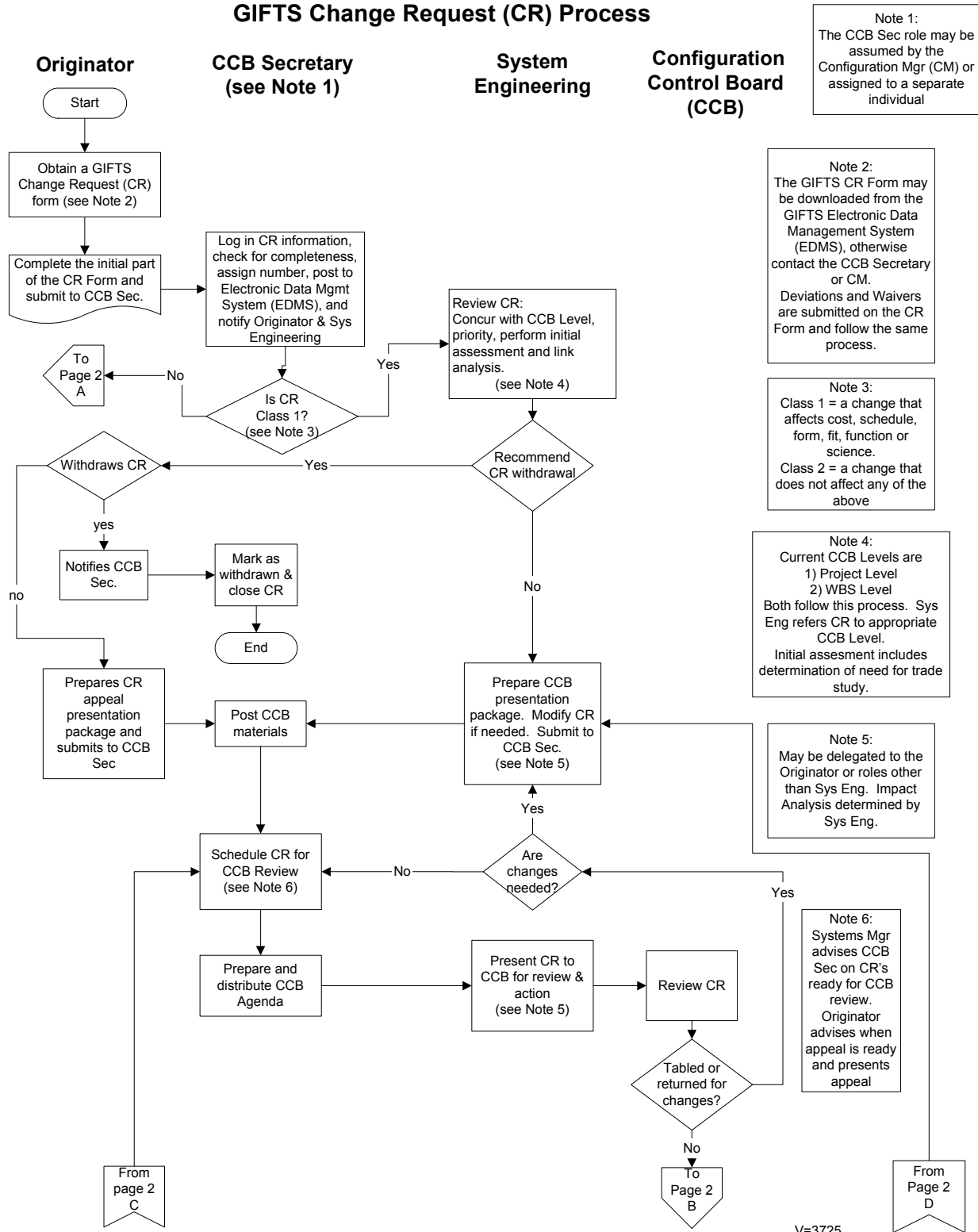


Figure 4.3-1 GIFTS Configuration Control Process (page-1)

Title: Configuration Management Plan	
Document No.: GIFTS 01-011	Version: 2.0

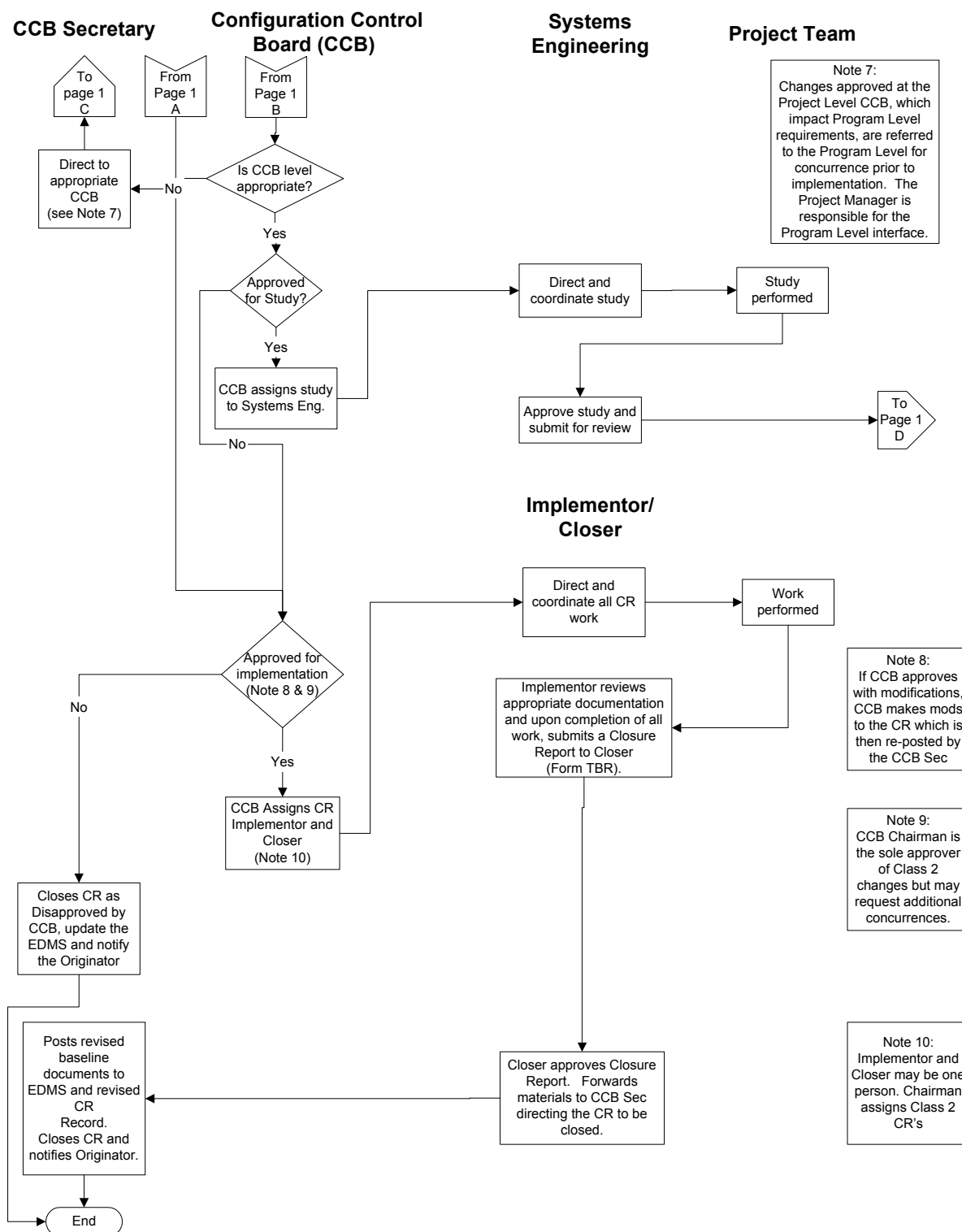


Figure 4.3-1 GIFTS Configuration Control Process (page-2)

Title: Configuration Management Plan	
Document No.: GIFTS 01-011	Version: 2.0

4.3 Problem Reporting and Corrective Action System

For the GIFTS Project, the problem reporting and corrective action system follows the procedures identified in the Quality Assurance Management Plan (GIFTS 01-006) and/or Product Assurance Plans for the appropriate elements.

4.4 Waivers and Deviations

Deviations and Waivers are requests to deviate from baseline requirements either before or after the product is manufactured.

Deviations and waivers shall follow the same procedures previously identified for a change to a baselined item. All dispositioned changes shall be documented in either a contract modification or an approval letter from the CCB and be processed through the GIFTS Project Manager.

5 CONFIGURATION STATUS ACCOUNTING

A records system is to be maintained which assures the systematic recording of information required for the complete identification of the configuration. The Configuration Status Accounting system will be implemented by the CM and shall:

- a. Identify the current approved configuration documentation and identification number associated with each CI.
- b. Record and report the status of proposed engineering changes from initiation to final approval/contractual implementation.
- c. Record and report the results of configuration audits to include the status and final disposition of identified discrepancies.
- d. Record and report the status of all critical and major requests for deviations and waivers which affect the configuration of a CI.
- e. Record and report implementation status of authorized changes.
- f. Provide the traceability of all changes from the original baselined configuration documentation of each CI.
- g. Report the effectivity and installation status of configuration changes to all CIs at all locations.

5.1 Configuration System Reports

The GIFTS configuration system is a database used to record and retrieve all GIFTS configuration items and associated information. Some of the items available from this system could be:

- (1) A list of all the CR forms and the status.
- (2) A list of all the baselined CIs to include documents, drawings, hardware and software.
- (3) The problem report status provides a list of open/closed problem reports.

Title: Configuration Management Plan	
Document No.: GIFTS 01-011	Version: 2.0

5.2 Configuration Status Accounting Report

This is a formal report and provides the complete status of:

- a. The contract, including the SOW and other contract documents
- b. The GIFTS system specification and the other documents identified in the document tree
- c. The GIFTS equipment planning diagrams
- d. Program plans
- e. Problem reports
- f. Proposed changes
- g. Implementation of approved changes

6 CONFIGURATION VERIFICATION (AUDITS)

Configuration Audits are performed when requested by the Project Manager or Mission Assurance Manager (MAM). Configuration Audits consist of the Functional Configuration Audit (FCA) and the Physical Configuration Audit (PCA). The MAM is responsible for conducting periodic audits of the configuration management system. This audit process ensures that the configuration management procedures are being adhered to, are properly implemented and that the CCB process is being followed. The audit also ensures that the contractor's configuration management practices are sufficient and compatible with the requirements of the contractors CMPs. Audits will be performed according to the GIFTS Quality Assurance Management Plan (GIFTS 01-006) and the CM will assist as required.

6.1 Functional Configuration Audits

A FCA shall be conducted for each configuration item for which a separate development or requirements specification has been baselined. The objective of the FCA shall be to verify the CIs and system's performance against its approved configuration documentation. Test data for the FCA shall be that collected from the test of the configuration of the item that is to be formally accepted or released for production.

6.2 Physical Configuration Audits

The PCA shall be the formal examination of the as-built configuration of a CI against its design documentation. The PCA for a CI shall not be started unless the FCA for the CI has already been accomplished or is being accomplished concurrent with the PCA. After successful completion of the audit and the establishment of a baseline, all subsequent changes are processed by formal change requests. The PCA also determines that the acceptance testing requirements prescribed by the documentation is adequate for acceptance of production units of a CI by QA activities. The PCA includes a detailed audit of engineering drawings, specifications, technical data, and tests utilized in production of CIs, and design documentation, listings, and operation and support documents for CSCIs. The PCA shall include an audit of the released engineering

Title: Configuration Management Plan	
Document No.: GIFTS 01-011	Version: 2.0

documentation and quality control records to make sure the “as-built” or as-coded configuration is reflected by this documentation. For software, the product specification, interface design document, and version description documents shall be part of the PCA.

6.3 Configuration Verification

The MAM and/or the Quality Assurance Specialist will perform periodic surveys of assembly/disassembly (if applicable), integration, and testing phases with emphasis on verifying that the configuration is identifiable and that changes are traceable to an established baseline and that the drawings and hardware are in conformance. The MAM and/or a designee, will perform periodic reviews of design, fabrication, assembly, integration, and testing phases with emphasis on verifying that the configuration is identifiable and that changes are traceable to an established baseline and the design drawings and hardware are in conformance.

7 RECORDS COLLECTION AND RETENTION

Archiving of GIFTS products will include documents, drawings, configuration management reports, CI listings, etc., and shall be controlled by the CM. Hardcopies are stored in the Project office GIFTS files. Copies of each product are maintained as a historical record for the GIFTS project until the project is terminated.

8 CONTRACTOR/VENDOR CONTROL

All project specific hardware and software supplied by outside suppliers shall meet the intent of this GIFTS CMP. Contractor and subcontractor configuration management requirements are set by the customer contract and will implement configuration management according to individual company/organization process and contractual requirements and agreements. All items either purchased from a vendor or supplied by a contractor are reviewed/approved by QA and will be controlled according to this plan.

9 ACRONYMS

The following table contains an alphabetical list and definitions of all acronyms and abbreviations used in this document and any word used in a non-standard way.

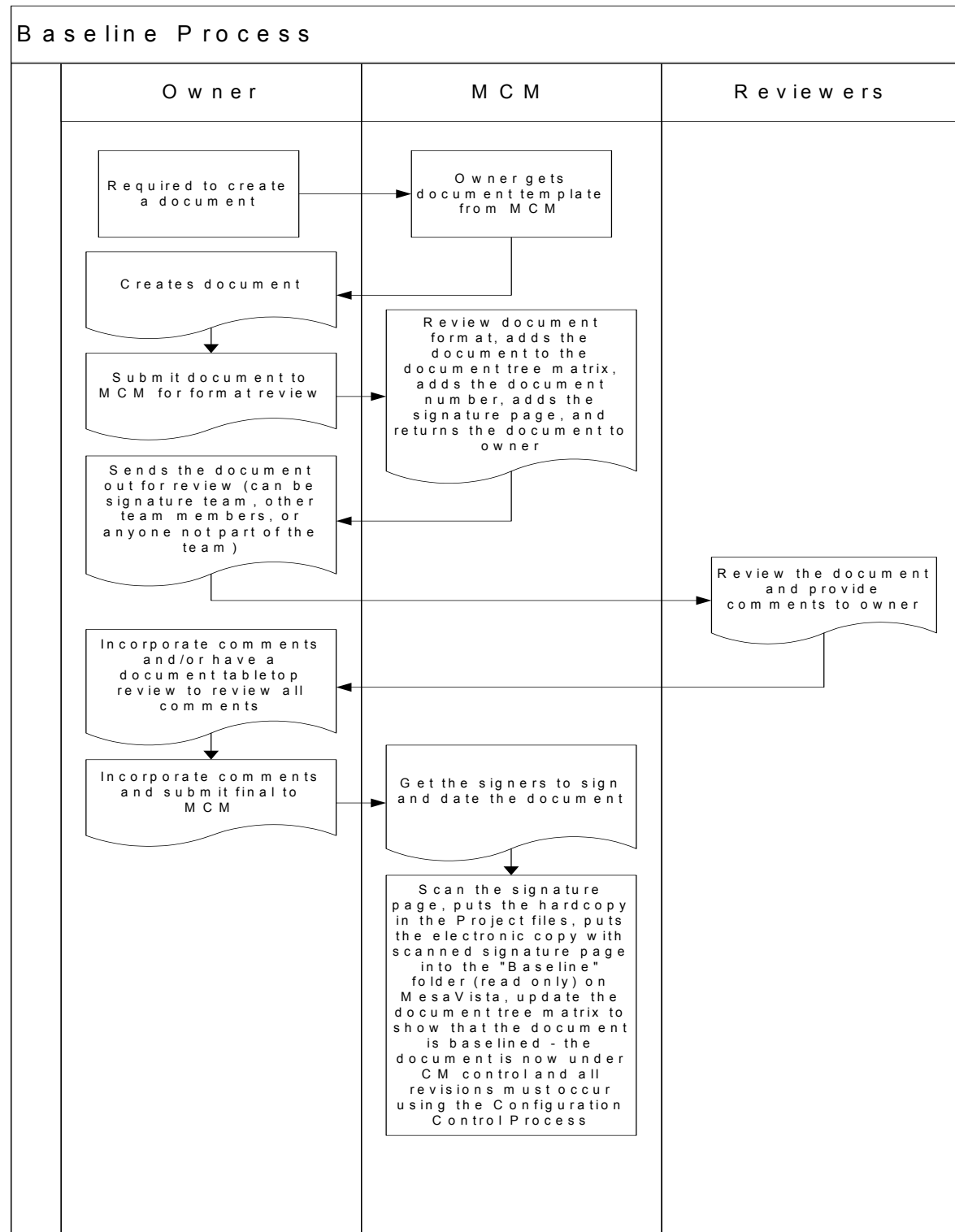
ANSI	American National Standards Institute
CCB	Configuration Control Board
CDR	Critical Design Review
CI	Configuration Item
CM	Configuration Manager
CP	Center Procedures
CR	Change Request
CSCI	Computer Software Configuration Item

Title: Configuration Management Plan	
Document No.: GIFTS 01-011	Version: 2.0

EIA	Electronic Industries Association
FCA	Functional Configuration Audit
FPGA	Field Programmable Gate Array
GIFTS	Geosynchronous Imaging Fourier Transform Spectrometer
GSE	Ground Support Equipment
ICD	Interface Control Document
IEEE	Institute of Electrical and Electronics Engineers
ISO	International Organization for Standardization
LAPG	Langley Procedures and Guidelines
LaRC	Langley Research Center
LMS	Langley Management System
CMP	Configuration Management Plan
MIL	Military
NASA	National Aeronautics and Space Administration
NOAA	National Oceanic and Atmospheric Administration
NPG	NASA Procedures and Guidelines
PCA	Physical Configuration Audit
QA	Quality Assurance
STD	Standard

Title: Configuration Management Plan		
Document No.: GIFTS 01-011		Version: 2.0

APPENDIX A - How to Baseline a Document



Title: Configuration Management Plan	
Document No.: GIFTS 01-011	Version: 2.0

APPENDIX B – Change Forms

GIFTS Change Request Form

Software Change Report Form

Hardware Change Report Form

Instructions for both Change Reports

Title: Configuration Management Plan	
Document No.: GIFTS 01-011	Version: 2.0

GIFTS CHANGE REQUEST FORM

CONFIGURATION CHANGE REQUEST (CCR)		CCR Number:	Rev:
Project: GIFTS	Project Manager: James Miller	Date CCR Originated:	Type: CR
CCR Title:			Class: I
Originator:	Organization:	Phone:	Priority: Routine
WBS Affected:			CCB: Project
Documents Affected:			
Description of Proposed Change:			
Rationale for Proposed Change (With Advantages/Disadvantages):			

Title: Configuration Management Plan	
Document No.: GIFTS 01-011	Version: 2.0

<i>Impact – Check Blocks of Impacted Items:</i>				
<input type="checkbox"/> AGE/GSE	<input type="checkbox"/> Attitude Control	<input type="checkbox"/> Command	<input type="checkbox"/> Communications	<input type="checkbox"/> Cost
<input type="checkbox"/> Data Handling	<input type="checkbox"/> Deliverables	<input type="checkbox"/> Electrical	<input type="checkbox"/> Ground Systems	<input type="checkbox"/> Harness
<input type="checkbox"/> I&T	<input type="checkbox"/> Interfaces	<input type="checkbox"/> IV&V	<input type="checkbox"/> Launch	<input type="checkbox"/> Mass
<input type="checkbox"/> Mission Ops	<input type="checkbox"/> Parts/Materials	<input type="checkbox"/> Performance	<input type="checkbox"/> Power	<input type="checkbox"/> Qualification
<input type="checkbox"/> Quality Assurance	<input type="checkbox"/> Re-Accept. Test	<input type="checkbox"/> Reliability	<input type="checkbox"/> Re-Qual. Test	<input type="checkbox"/> Safety
<input type="checkbox"/> Schedule	<input type="checkbox"/> Science	<input type="checkbox"/> Software	<input type="checkbox"/> Space	<input type="checkbox"/> Spacecraft
<input type="checkbox"/> Structure	<input type="checkbox"/> System Safety	<input type="checkbox"/> Technical Content	<input type="checkbox"/> Telemetry	<input type="checkbox"/> Test Procedure
<input type="checkbox"/> Thermal	<input type="checkbox"/> Weight	<input type="checkbox"/> Other		

Impact Comments:

Schedule Impact: Yes

Cost Impact: Yes

Estimated cost R&D \$k.

Estimated IMS, \$K

Estimated Manpower Myrs

Title: Configuration Management Plan	
Document No.: GIFTS 01-011	Version: 2.0

CCB Comments:

Board Member Approval/Concur			
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CCB Disposition		
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CCB Chairman	Approve	Date:
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Closure Report:

CCB Secretary	Date:
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Title: Configuration Management Plan	
Document No.: GIFTS 01-011	Version: 2.0

Title: Configuration Management Plan	
Document No.: GIFTS 01-011	Version: 2.0

Description of Proposed Change (Continued):
(Text, graphics and tables)

Title: Configuration Management Plan	
Document No.: GIFTS 01-011	Version: 2.0

GIFTS Software Change Report			
1. Related CR Number:			
2. Lead System Designer:		3. Phone:	4. Date:
S/W Changed			
5. Source Code Identification	6. Revision #:	7. Date:	
H/W Affected (Optional)			
8. MFG. Model #:	9. Revision #:	10. Date:	
Documents Affected	(Optional)		
11. Document Id:	12. Title	13. Revision #:	14. Date:
15. Actions Taken:? Corrections/Change Implemented:			

Title: Configuration Management Plan	
Document No.: GIFTS 01-011	Version: 2.0

16. Lead System Designer:	17. Date:	18. Change Verified By:	19. Date:
20. Documentation Verified By:	21. Date:	22. Relating CR(s) Closed By:	23. Date:
24. CM Signature:	25. Date:	26. CCB Chairperson Signature:	27. Date:
28. Current Status: <input type="checkbox"/> Verified <input type="checkbox"/> Waiting on Hardware <input type="checkbox"/> Pending <input type="checkbox"/> Fixed <input type="checkbox"/> On Hold			
29. Actual Cost:			
30. Resource:			
31. Schedule:			
32. Technical Risk:			

Title: Configuration Management Plan	
Document No.: GIFTS 01-011	Version: 2.0

GIFTS Hardware Change Report			
1. Related CR Number:			
2. Lead System Designer:		3. Phone:	4. Date:
H/W Changed			
5. MFG. Model #:		6. Revision #:	7. Date:
S/W Affected (Optional)			
8. Source Code Identification:		9. Revision #:	10. Date:
Documents Affected	(Optional)		
11. Document Id:	12. Title	13. Revision #:	14. Date:
15. Actions Taken:? Corrections/Change Implemented:			

Title: Configuration Management Plan	
Document No.: GIFTS 01-011	Version: 2.0

16. Lead System Designer:	17. Date:	18. Change Verified By:	19. Date:
20. Documentation Verified By:	21. Date:	22. Relating CR(s) Closed By:	23. Date:
24. CM Signature:	25. Date:	26. CCB Chairperson Signature:	27. Date:
28. Current Status: <input type="checkbox"/> Verified <input type="checkbox"/> Waiting on Hardware <input type="checkbox"/> Pending <input type="checkbox"/> Fixed <input type="checkbox"/> On Hold			
29. Actual Cost:			
30. Resource:			
31. Schedule:			
32. Technical Risk:			

Title: Configuration Management Plan	
Document No.: GIFTS 01-011	Version: 2.0

SOFTWARE/HARDWARE CHANGE REPORT: Execution

1. *Related CR number* - Fill in the CR # associated with the change.
2. *Lead System Designer* - The person in charge of meeting the change request requirements.
3. *Phone* - The lead system designer's phone number.
4. *Date* - Date the change request was implemented

Software (S/W) Change Report:

S/W Changed (The list of software items (e.g. source files) that were added/modified/deleted to implement the change.):

5. *Source Code Identification* - The source code identification used to name the software.
6. *Revision number* - The new revision number assigned to the source code item.
7. *Date* - The date completed.

H/W Affected: (Optional)

8. *Manufacturer Model Number* - The hardware number used to identify the piece of hardware.
9. *Revision Number* - The new revision number assigned to the hardware item.
10. *Date* - The date completed.

Hardware (H/W) Change Report

H/W Changed (The list of hardware items (e.g. drawings) that were added/modified/deleted to implement the change.):

5. *Manufacturer Model Number* - The hardware number used to identify the piece of hardware.
6. *Revision Number* - The new revision number assigned to the hardware item.
7. *Date* - The date completed.

S/W Affected: (Optional)

8. *Source Code Identification* - The source code identification used to name the software.
9. *Revision number* - The new revision number assigned to the source code item.
10. *Date* - The date completed.

BOTH

Documents Affected (Optional)

11. *Document ID* - The document identification number.
12. *Title* - The title of the document.
13. *Revision Number* - The new revision number assigned to the document item.

Title: Configuration Management Plan	
Document No.: GIFTS 01-011	Version: 2.0

14. *Date* - The date completed.
15. *Action Taken* - The action taken to implement the change.
16. *Lead System Designer* - Signature of the person(s) executing the change request.
17. *Date* - Date of the signature(s) in block 16.
18. *Change Verified By* - Signature of person who verifies the change has taken place.
19. *Date* - Date of the signature in block 18.
20. *Documentation Verified By* - Signature of person who verifies any change of the documentation.
21. *Date* - Date of the signature in block 20.
22. *Relating CR(s) Closed By* -- Signature that proves the closure of any relating change request(s).
23. *Date* - Date of the signature in block 22.
24. *CM Signature* -- Signature of the appropriate configuration coordinator.
25. *Date* - Date of the signature in block 24.
26. *CCB Signature* - Signature that proves the closure of the change request.
27. *Date* - Date of the signature in block 26.
28. *Current Status* - Status of the change request is either ***Pending, Verified, Fixed, Waiting on Hardware, or On Hold.***
29. *Actual Cost* - The actual cost of a purchase request or credit purchase.
30. *Resource* - The person-hours required to implement the change.
31. *Schedule* - Program schedule impact of the change.
32. *Technical Risk* - Requirements that are impacted by the change.